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ceous and Tertiary, and checking the accuracy of conclusions derived from other lines of evidence.

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THE BROWN GRAPE APHID

This aphid is commonly known as *Macrosiphum viticola* Thomas. Unable to find any record of its complete life cycle the writers have made some observations on the form at Vienna, Va. These seem worthy of note at the present time, in view of the economic importance of the species.

The eggs are polished black and are laid during November or late October. They are placed in the axils of the leaves of *Viburnum prunifolium* Linn. In the spring they hatch before the leaves open and the young feed on the bursting flower buds. The stem mother appears unlike a *Macrosiphum,* having short cornicles. Late in April, or in early May, the second generation matures and this nearly all becomes alate.

Such alate forms are unable to subsist on the *Viburnum,* but migrate to the grape and produce the third generation on that plant. Here the species lives throughout the summer, producing apterous and alate forms. We have also some intermediates similar to those recently described by us in *Aphis pomi* DeGeer. These intermediates were taken in May and June.

The fall migrants are unlike the spring migrants in sensory characters, the sensoria on the antennæ averaging about as follows: Segment III., 30; IV., 25; V., 15. These fall migrants may be found depositing their young upon the *Viburnum* leaves during the middle of October.

The ovipara is apterous and, after being fertilized by the alate male, deserts the leaves and migrates to the twigs in order to deposit her winter eggs.

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THE RELATION OF MITOCHONDRIA TO GRANULES OF THE VITAL AZO DYES[1]

The more ardent hopes which relate to the subject of vital staining are perhaps connected with the successful staining of living, preformed components of the cell. Instances of such a phenomenon are often enough alleged without sufficient substantiation. Goldmann,[2] whose papers did so much to attract general interest to this subject, believed that the dyes, isamine blue and trypan blue, must be looked upon as combining with some preformed, but hitherto unidentified, elements of the living cell, and this is substantially the attitude of Kiyono,[3] who has added the latest considerable contribution to this subject. Tschaschin[4] of Maximow's laboratory has given this hypothesis its most concrete formulation by claiming that we are dealing with an elective, truly vital staining of the mitochondria of connective tissue cells. On the other hand, Evans and Schulemann[5] came to the conclusion that the process of staining with these dyes is more intelligible as an ultra-microscopic phagocytosis, and interpreted the dye granules as storage phenomena, in no way related to the living elements of the cell. In view of this discrepancy in the points of view of different workers, a cytological study of some of the cells which react to azo dyes has been suggested by Dr. Evans and carried out under his direction.

The study has been limited to cells of subcutaneous tissue in adult mice. As has been

[1] From the anatomical laboratory of the Johns Hopkins Medical School, Baltimore.

[2] Goldmann, E. E., "Die äussere und innere Sekretion des gesunden und kranken Organismus im Lichte der 'vitalen Färbung,'" Tübingen, 1909. "*Neue Untersuchungen usw.,*" Tübingen, 1912.

[3] Kiyono, "Die vitale Karminspeicherung," Fischer, 1914.

[4] Tschaschin, S., *Folia Hæmatologica,* Bd. XIV., S. 295, 1912; Bd. XVI., S. 247, 1913, Bd. XVII., S. 317, 1913.

[5] Evans and Schulemann, *Jahresb. d. Sch. Ges. f. Vat. Kul.,* 1913; Science, Vol. XXXIV., p. 443, 1914; *Deut. med. Wochenschr.,* No. XIII., 1914.

described by Tschaschin, Evans and Schulemann, and others, the two common types of connective tissue cells are readily distinguished by their reaction to the vital stain, the clasmatocytes storing large masses, the fibroblasts much more minute granules of the dye. It can not be denied that the delicate punctate and rod-like deposits of isamine blue, as seen in fibroblasts, often make an astonishingly close approach to mitochondria in appearance. But are they mitochondria? This question could only be answered by applying to the cells in question the criteria for the recognition of mitochondria, which are well known to cytological technique. We have confined ourselves to three methods, which have been pursued until they yielded constant and reliable results. These are the iron hematoxylin method, the aniline acid-fuchsin methyl-green method (Bensley), and supra-vital staining with janus green (Michaelis, Laguesse, Bensley, Cowdry).

On studying in this way the fibroblasts of the mouse, mitochondria can easily be demonstrated. They disagree in several respects with the alleged isamine blue mitochondria. The true mitochondria are always scantier in number than the deposits of isamine blue which occur in fibroblasts of chronicly stained animals, and they are more definitely threadlike than the isamine blue structures. Further, it is quite possible to see the unstained mitochondria lying between the isamine blue granules in living cells, examined immediately after removal from the body, and finally, by staining with janus green, one can see these previously unstained structures now add themselves to the number of stained cytoplasmic elements, where their peculiarities as regards color, shape, size and arrangement are still retained. These conclusions obtain even more emphatically with trypan blue and presumably with all of the benzidene dyes.

In the vital staining with azo dyes, it is not true, consequently, as Tschaschin maintains, that we have a vital staining of the mitochondrial apparatus in some cells, in addition to the gross reception of the dye by the macrophages. Indeed, Tschaschin believes that in the macrophages themselves the mitochondria are stained vitally, but that here they are exclusively granular, spherical forms, and suffer all stages of transformation into the large "secretory" granules. The methods detailed for the study of fibroblasts yield essentially similar results when applied to the macrophages. These, in contradistinction to the claim of Tschaschin, have true mitochondria, some of them filiform, among the azo dye granules.

This discussion has wider implications, for Tschaschin's ideas have been accepted by Kiyono even though he recognizes some anomalous aspects of such a conclusion. Kiyono seems willing to believe that the macrophages may react to these dyes in a phagocytic or physical way but that this can not be the explanation for all the granules produced by these dyes, since the reception and storage of foreign substances by some of the other cells which are vitally stained is a phenomenon unknown by other methods. This argument seems beside the point. We can only state that in no case known to us have the granules produced by vital azo dyes been found to be identical with the mitochondria of the vitally stained cells.

KATHERINE J. SCOTT

THE AMERICAN PHILOSOPHICAL SOCIETY

THE annual general meeting of the American Philosophical Society was held in the rooms of the society in Philadelphia on April 22, 23 and 24. The meeting was opened on Thursday afternoon by President W. W. Keen, who, with Vice-presidents A. A. Michelson, W. B. Scott and Professor C. L. Doolittle, presided over the various sessions.

On Friday evening a reception was held in the hall of the Historical Society of Philadelphia, at which William Morris Davis, Sc.D., Ph.D., professor emeritus of geology, Harvard University, gave an illustrated lecture "On New Evidence for Darwin's Theory of Coral Reefs." The lecture described the chief results of a Shaler Memorial Voyage across the Pacific in 1914, with studies of the Fiji group, New Caledonia, the Loyalty Islands, the New Hebrides, the Great Barrier Reef of Australia and the Society Islands.

On Saturday afternoon a symposium was held on the Figure, Dimensions and Constitution of the Interior of the Earth. The subject was discussed